

The spraying of plants.

NOTHING more remarkable has taken place in the history of botany than the development of methods for the protection of cultivated plants against the attacks of fungi and insects, especially by spraying, and the consequent encouragement given to the study of the life history of fungi. It is scarcely more than a decade since the first impetus was felt, its inception being traceable to the discovery of the value of Bordeaux mixture as a fungicide and Paris green as an insecticide. The former was first used in France and the latter in central United States. The importance of these discoveries cannot be overestimated, and the extent and variety of the practical and scientific results which have followed can only be fully appreciated by one studying the subject. It is therefore a valuable service which Mr. E. G. Lodeman³ has rendered to practical and scientific men alike by the publication of a work on the general subject of spraying.

In four hundred closely printed pages he has recorded a great number of facts and opinions, and given a clear survey of the growth of the subject and its present status. Beginning with the history and principles of spraying in general, he traces its rise and adoption in foreign countries and in America, together with improvements in machinery for its application; then discusses the action of fungicides and insecticides upon the parasite, the host, and the soil, and devotes the last third of the work to descriptions of fungous diseases and insect enemies of many kinds of plants, with directions for treatment.

There are several aspects in which the work is a specially valuable contribution to scientific literature. The chronological study of the subject in its different lines of development and from various geographical centers, with the abundant reference citations, presents a record of lasting importance, although necessarily limited by the size of the volume.

The fact that America leads in the study of plant diseases, in devising new remedies, perfecting those already known, and in the readiness with which the cultivator accepts and applies the suggestions of the investigator is cause for congratulation, as it augurs well for the continued growth of pathology and incidentally of other branches of botany in this country.

The number of diseases brought to light and the number of remedies suggested have been so perplexingly numerous that the cultivator and the investigator alike will welcome the part of the work dealing with specific diseases and their treatment. Although necessarily brief, it is sufficient for the guidance of the cultivator, and affords the student a needed survey of the field. It is fortunate that insects and fungi are examined with equal

³LODEMAN, E. G.—The spraying of plants: a succinct account of the history, principles and practice of the application of liquids and powders to plants for the purpose of destroying insects and fungi. With a preface by B. T. Galloway. 12mo. pp. xvii + 399. Illust. New York and London: The Macmillan Co. 1896. \$1.00.

thoroughness in this work, as it gives an opportunity to compare the results of the labors of entomologists and mycologists.

As a piece of book making, the work leaves nothing to be desired. It forms the second volume of the Rural Science Series, edited by Professor L. H. Bailey of Cornell University.—J. C. A.

A new "Vegetation der Erde."

THE CLASSICAL *Vegetation der Erde* of Grisebach will always be looked upon as one of the great books upon the distribution of plants. But recent progress has brought to knowledge much of detail which now needs to be incarnated in general principles. In brief, such is the plan of Professors Engler and Drude. They propose to edit a collection of monographs upon the various phases of plant geography under the general title *Vegetation der Erde*, thinking that the time is ripe for at least beginning a publication which shall, on the one hand, bring to light the lifelong work of some of the older savants, and, on the other, enable younger investigators to know what needs to be done and to plan their studies accordingly.

No definite order for the monographs can be announced, and almost entire freedom will be allowed individual contributors in the arrangement of their material. Naturally the countries of central and western Europe will be the first to be treated, on account of the more thorough study to which they have been already subjected. Each monograph will constitute an independent volume, to be published in the German language, by translation, if need be, from the native tongue of the author. The editors themselves promise some of the general work upon plant geography and plant history, together with the special treatment of certain regions.

This is a courageous plan, demanding even more optimism and energy than the inception of the great *Pflanzenfamilien* which is now nearing completion. We trust that the senior proposer, Professor Engler, of Berlin, will be enabled to see this materialize, as he has seen his monumental *Pflanzenfamilien*. Certainly he will have an able coadjutor in Professor Drude of Dresden. No one who inspects the tentative outline of the work can fail to be impressed with its comprehensiveness. Three sections are suggested. The first, treating of climatology in its influence upon the distribution of plants, the developmental history of floras, and phylogenetic investigations upon geologic and biological principles, will naturally be the last to begin. The second will treat the plant formations, especially those of Europe and neighboring regions, while the third will discuss the principles of plant distribution as illustrated by natural floral regions.

An editorial in this journal recently⁴ urged students, instead of compiling state floras after the usual pattern, to work out carefully the distribution

⁴ BOTANICAL GAZETTE 21: 303. May 1896.